SMITH+GARDNER
ENGINEERS

ADDRESS
14 N. Boylan Avenue, Raleigh NC 27603

TEL
919.828.0577

WEB
www.smithgardnerinc.com

July 22, 2013

Mr. Geoffrey H. Little
Environmental Engineer
Solid Waste Section
NCDENR
1646 Mail Service Center
Raleigh, NC 27699

RE: Dunn-Erwin LCID Landfill Seep Response
Harnett County, NC (Permit No. 43-02)

Dear Mr. Little:

Smith Gardner, Inc. (S+G), on behalf of Harnett County, presents this summary report regarding the recent leachate seep response at the Dunn-Erwin LCID landfill facility (DELF) in Dunn, North Carolina. As you are aware, in less than 24 hours, from June 7-8, 2013 the facility received over eight (8) inches of rain at the site resulting from inclement weather patterns in the region; subjecting the site to leachate response actions at three (3) locations as follows:

1. Transfer Station;
2. C&D Landfill; and
3. LCID Landfill

Actions performed by Harnett County are summarized below.

Transfer Station

At the transfer station, the leachate holding tank was subject to an overflow due to increased stormwater through the floor drains nearest the entrance. The overflow was identified by the leachate collecting outside the tank cover and settling in a low area. It appeared that the low area was sufficient to contain the overflow without any release beyond the immediate transfer station vicinity. A response and disposal information summary is provided below:

Disposal Volume:	~400 gallons
Response Method:	Repair release area, Pump and Haul leachate
Leachate Disposal:	Harnett County WWTP
Soil Response:	Contaminated soil was excavated and put into the transfer station for disposal with the MSW heading to the Waste Industries Sampson County Landfill.
Future Action:	No further action required.

C&D Landfill

A small seep was identified on the C&D landfill slope, where it appeared to flow into a drain. This slope drain empties into sediment basin number 3 from the C&D landfill, where it appears

that an unknown leachate quantity may have intermixed with stormwater during the rain events and entered the sediment basin. A berm was immediately constructed to prevent further leachate from reaching the slope drain and entering the sediment basin. A response and disposal information summary is provided below:

Disposal Volume:	~87,500 gallons
Response Method:	Berm, Pump, and Haul
Disposal Location:	Harnett County WWTP
Sample Results:	Samples from sediment basin 3 were collected on June 10, 2013 in accordance with the Leachate Management Plan. Lab results indicate no soil or stormwater impacts occurred. Furthermore, no stressed or dead vegetation was witnessed.
Future Action:	No further action required.

LCID Landfill

Multiple seeps were discovered on the southern side (down gradient) of the LCID landfill area requiring a compound response to ensure leachate remained inside the debris footprint. An unknown quantity of seeps may have intermixed with the rain events. As you are aware, the LCID facility is along the northern boundary of the large Dunn/Erwin Landfill property providing a significant buffer from the surrounding area. The compound response included the following:

1. Plug: Harnett County's initial response was to excavate at two (2) seep locations shown in **Figure 1** (attached) and compact the areas with clay. This method successfully remedied one leachate seep; however, flow from the second was greater that could be contained with the clay "plug".

2. Containment: Secondary response included berm construction (shown in **Figure 1**) to contain the leachate within the debris footprint. Pump and haul was instituted to remove contained leachate. Approximately 32,000 gallons were hauled within the first 24 hours.

3. Trench: With storms threats continuing, pumping did not appear to stabilize the release. Therefore, exploratory test pits were excavated, within the debris limits, to find layers to re-route leachate and promote infiltration vertically. Trenches were excavated and filled with stone in various areas of the debris limits as shown in **Figure 1**. No groundwater was encountered during the exploratory tests and throughout trenching.

4. Sample: A sample will be taken as shown on **Figure 1** to determine if any soil impacts have occurred. The results will be forwarded to the Section with any recommendations (if necessary) to remediate further impacts.

5. Operational Adjustments: Daily operation at the LCID has been adjusted to reduce the potential for seeps by re-grading the landfill surface to a minimum of 5% slopes and to incorporate regular landfill surface inspections to identify areas of differential settlement. Any areas where settlement is recognized should be immediately backfilled with debris or soil to prevent points of further infiltration into the waste.

6. Stormwater Control: Stormwater control measures shall include the installation of a run-on diversion channel to promote rainfall from entering the facility from the northeast side of the site.

7. Permit Document Revisions: The LCID Permit Renewal application, currently being prepared by C.T. Clayton, Sr. Engineers, will include long term strategies, better planning and operational provisions. These provisions include increasing the side slope, additional soil loading of visible seep areas, filling of low areas and depressions, frequent monitoring and adjusting the disposal methods to include mulching, recovery, and recycling, as well as updates to the operations plan to include more specific language regarding seep control and emergency management.

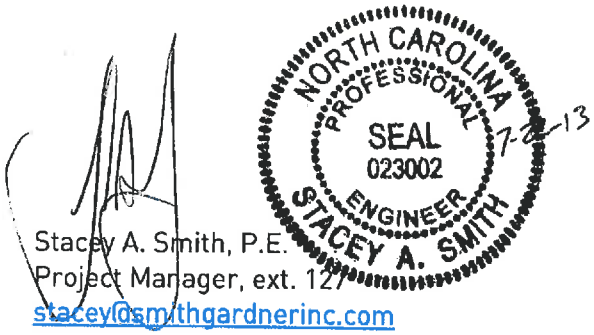
At this time, they continue to monitor the conditions daily. Considering the extremely wet summer that the state has encountered this year, progress has been slow towards implementing stormwater control and operational adjustments. A summary of response and disposal information is provided below:

Disposal Volume:	~32,000 gallons
Response Method:	Berm, Pump, and Haul, Plug, Trench, and Operational Changes
Disposal:	Harnett County WWTP
Remediation:	No remediation necessary outside of the debris footprint.
Future Action:	Sample, Monitor, Respond, and Proceed with Operational Adjustments.

We appreciate the Section's assistance in the immediate response to the County's request on June 14, 2013 **(copy attached)** and the ongoing coordination in the response to the situation. Please feel free to contact us with any questions or concerns at (919) 828-0577 or by email below.

Sincerely,
SMITH GARDNER, INC.

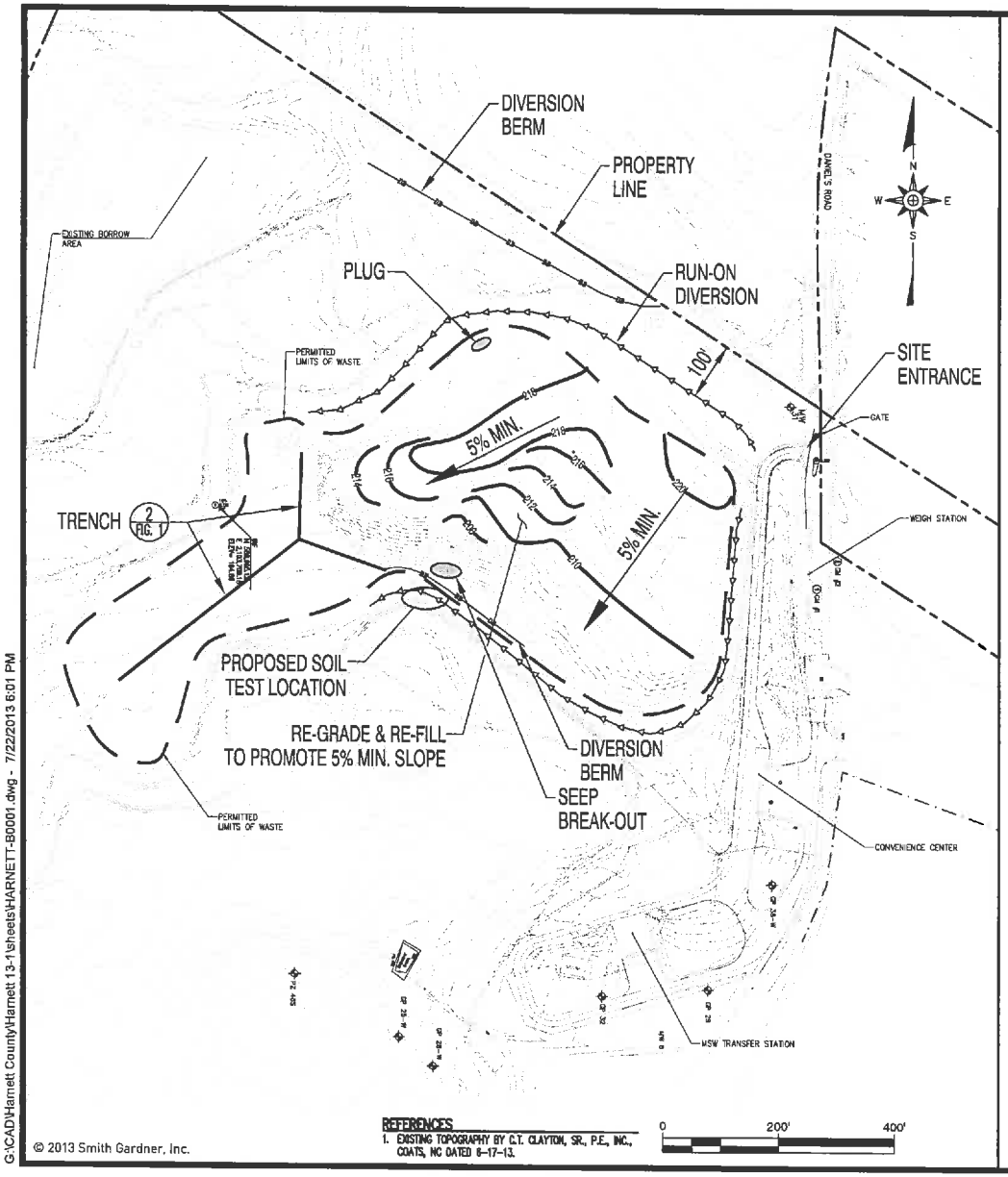
Madeline German, P.G.
Project Geologist, ext. 222
madeline@smithgardnerinc.com



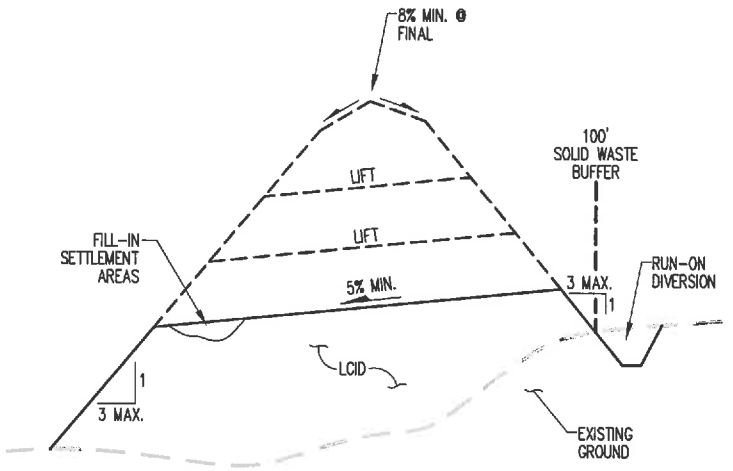
Stacey A. Smith, P.E.
Project Manager, ext. 127
stacey@smithgardnerinc.com

Attachments
Figure 1
Geoff Little email
Lab Results

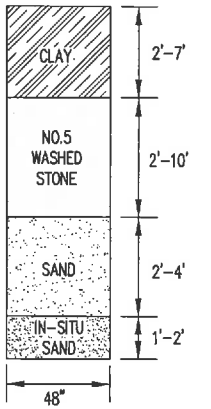
cc: Amanda Bader, P.E., Harnett County
C. Tyrus Clayton, P.E., C.T. Clayton Engineers
File



REFERENCES
1. EXISTING TOPOGRAPHY BY C.T. CLAYTON, SR., P.E., INC., COATS, NC DATED 6-17-13.



SECTION 1 FIG. 1



TRENCH 2 FIG. 1

PREPARED FOR:

HARNETT COUNTY
LCID LANDFILL

DRAWN: K.C.B.
APPROVED: S.A.S.
DATE: Jul 2013
SCALE: AS SHOWN
PROJECT NO: HARNETT 13-1
FILENAME: HARNETT-B0001
FIGURE NO. 1

PREPARED BY:

SMITH+GARDNER

NC LIC #C-0839 ENGINEERING

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

G:\CAD\Harnett County\Harnett 13-1\sheets\HARNETT-B0001.dwg - 7/22/2013 6:01 PM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Harnett County Dunn-Erwin Landfill	Dunn, NC	Harnett 13-1

Photo No.	Date:
1	6/8/13

Direction Photo Taken:

Description:

Seep within the limits of the C&D site.

Photo No.	Date:
2	6/12/13

Direction Photo Taken:

Description:

Pump and haul operation.

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Harnett County Dunn-Erwin Landfill	Dunn, NC	Harnett 13-1

Photo No.	Date:
3	6/14/13

Direction Photo Taken:

Description:

LCID after basin bridged over and compacted with clay.

Photo No.	Date:
4	6/14/13

Direction Photo Taken:

Description:

Stone placed into trench.

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6040

HARNETT CO. (DUNN/ERWIN)
GENERAL SERVICES HARNETT CO.
MS. AMANDA BADER
P.O. BOX 940
LILLINGTON ,NC 27546

DATE COLLECTED: 06/10/13
DATE REPORTED : 06/26/13

REVIEWED BY:

PARAMETERS	MDL	Leachate SWSL		Analysis Date	Analyst	Method Code
BOD, mg/l	2.0	2.0	5.1	06/11/13	TRB	5210B-01
COD, mg/l	20.0	20.0	71	06/18/13	TRB	H8000-79
Nitrate-Nitrite as N, mg/l			0.15	06/12/13	ANO	353.2 R2-93
Total Phosphorus as P, mg/l	0.04	0.04	0.06	06/13/13	ALB	365.4-74
Sulfate, mg/l	5.0	250.0	360	06/17/13	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	--- U	06/20/13	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	4.3 J	06/20/13	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	108	06/20/13	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.03 J	06/20/13	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	0.08 J	06/20/13	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	2.1 J	06/20/13	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	3.5 J	06/20/13	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	1.3 J	06/20/13	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	1.1 J	06/20/13	LFJ	EPA200.8
Nickel, ug/l	0.45	50.0	4.8 J	06/20/13	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	1.5 J	06/20/13	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	0.04 J	06/24/13	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.20 J	06/20/13	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	4.8 J	06/20/13	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	36	06/20/13	LFJ	EPA200.8

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HARNETT CO. (DUNN/ERWIN)
GENERAL SERVICES HARNETT CO.
MS. AMANDA BADER
P.O. BOX 940
LILLINGTON, NC 27546

CLIENT ID: 6040

ANALYST: MAO
DATE COLLECTED: 06/10/13
DATE ANALYZED: 06/18/13
DATE REPORTED: 06/26/13

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	Leachate	Trip Blank
1. Chloromethane	0.77	1.0	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 11 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

Page 1 of 1

CLIENT: 6040 **Week: 1**

HARNETT CO. (DUNN/ERWIN)
GENERAL SERVICES HARNETT CO.
MS. AMANDA BADER
P.O. BOX 940
LILLINGTON NC 27546

(910) 897-7070

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C. AT COLLECTION	# OF CONTAINERS	BOD	COD	Nitrate-Nitrite	T. Phosphorus	Sulfate	Metals	EPA 8260B	8260 Dup. 1	8260 Dup. 2
CHLORINE NEUTRALIZED AT COLLECTION														
pH CHECK (LAB)							2	2	2		2	2	2	2
CONTAINER TYPE, P/G						P	P	P	P	P	P	G	G	G
CHEMICAL PRESERVATION						A	C	C	C	A	A	E	E	E
Leachate	6/10/13	4:35pm			9	■	■	■	■	■	■	■	■	■
Trip Blank					2							■	■	

PARAMETERS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
- ☐ WASTEWATER (NPDES)
- ☐ DRINKING WATER
- ☐ DWQ/GW
- ☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY
(Y) N

SAMPLES COLLECTED BY: (Please Print)

SAMPLES RECEIVED IN LAB AT 0.6 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
H Bader	6/10 4:35	[signature]	6/11/13 355
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS: Spoke w/ Amand for date.

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 258935

Stacey Smith

From: Little, Geof <geof.little@ncdenr.gov>
Sent: Friday, June 14, 2013 8:46 AM
To: abader@harnett.org; Hearn, Robert
Cc: stacey@smithgardnerinc.com; pieter@smithgardnerinc.com; madeline@smithgardnerinc.com; Mussler, Ed; Shackelford, Dennis
Subject: RE: Harnett County LCID Landfill - Seep Response

Hi Amanda and all,

Thank you for discussing the above referenced situation with me yesterday.

Robert and I also discussed the situation this morning and concur that the immediate response is necessary to stabilize the leachate releases from the LCID landfill for the following reasons given us in your verbal report yesterday:

- Pumping and hauling in excess of 15,000 gallons of water per day has not stabilized the leachate release.
- No leachate from the LCID has left the property.
- You expect the trenches to draw the water down into the waste mass to relieve the pressure head that's generating the leachate releases.

We request that you submit to us a report by August 1, 2013, consisting of schematics locating the trenches in the waste mass along with depth and length information, monitoring reports, a summary of the immediate response outcome, and a brief but formalized written plan for our review prior to implementation that addresses the issues listed in the next paragraph.

For the intermediate and long-term response, we request the following be addressed:

- For the intermediate period, we request the water elevation in the trenches be monitored daily until the water elevation subsides.
- Should the water elevation not subside after several days, pumping and hauling leachate would be needed until the leachate subsides or some other approved means of managing the water level is identified.
- For the long-term period, we concur that the LCID cover needs to be enhanced and request the response plan detail the approach to be taken to address the cover.

Would you let Robert and I know when a site visit from us can be scheduled next week?

We appreciate the quick response taken by you and your staff to address the leachate issues at the DELF.

Thanks,

Geof

Geoffrey H. Little
Solid Waste Section
NC-DENR Division of Waste Management

may be subject to the N.C. Public Records Law
and may be disclosed to third parties.

From: Stacey Smith [mailto:stacey@smithgardnerinc.com]
Sent: Thursday, June 13, 2013 11:49 PM
To: Little, Geof
Cc: abader@harnett.org; pieter@smithgardnerinc.com; madeline@smithgardnerinc.com
Subject: Harnett County LCID Landfill - Seep Response

Geof and Robert,

As you both are aware, the heavy rains of the past few weeks have resulted in some seeps near the base of the Harnett County LCID landfill. In response to recent identification of these seeps, Harnett County has responded through containment berm (s) and has pumped and hauled over 30,000 gallons over the last few days.

This afternoon, Smith Gardner, Inc., Harnett County, and C.T. Clayton Engineers met on site to discuss emergency response measures to further contain the seep area. After some limited site investigation and test pits along the base of the area, we agreed that response should include a two (2) fold approach:

First, installation of trenches within the waste limits are to be excavated and backfilled with quarry screenings; such that seepage can be contained and turned down (and back) within the waste area.
Secondly, a recommended grading and filling plan should be developed to better manage infiltration through the top fill areas and better promote runoff.

The trenches will be installed as necessary to manage the recent surge events. This will be coupled with additional soil loading of the visible seep areas, frequent monitoring until the condition subsides until such time long term filling revisions can be implemented.

Please feel free to contact me with any questions.

Thank you,

Sas

Stacey A. Smith, P.E.
President, Senior Engineer

SMITH • GARDNER

14 N. Boylan Avenue
Raleigh, NC 27603

P (919) **828.0577 ext. 127**
C (919) **815.0803**

www.smithgardnerinc.com